

43. (Amended) An apparatus according to claim 12, wherein said first sensor receives said non-exposure light under an atmosphere being different from atmosphere under which said object is exposed.

REMARKS

Claims 1, 12, 17-26 and 28-50 are pending. By this Amendment, claims 1, 23-25, 31, 42 and 43 are amended. Reconsideration based on the above amendments and following remarks is respectfully requested.

The attached Appendix includes marked-up copies of each rewritten claim (37 C.F.R. §1.121(c)(1)(ii)).

Applicants gratefully appreciate the courtesies extended to Applicants' representative by Examiner Brown in the January 7, 2003 personal interview. The points discussed are incorporated into the following remarks.

I. THE CLAIMS DEFINE ALLOWABLE SUBJECT MATTER

The June 17, 2002 Office Action rejected claims 1, 12, 17-26 and 28-50 under 35 U.S.C. §103(a) as unpatentable over U.S. Patent No. 6,142,641 to Cohen et al. (hereinafter "Cohen"). The rejection is respectfully traversed below relative to the claim amendments of this Supplemental Amendment.

A. Claims 1 and 29-39:

Cohen only discloses the testing of the alignment of the four mirrors 2-5 used in the lithography projection system 1 via the pin mirror interferometer 30 of Figs. 5A and 5B which uses light at visible to UV wavelengths generated by source 31 and the testing of the surface shapes of the mirrors 2-5 via the pin mirror interferometers of Figs. 6A, 6B, 7, 8, and 9.

Unlike the claimed invention, Cohen does not even suggest the receiving of exposure light through at least a part of the optical system with a second sensor in order to obtain an

optical property of the optical system at the wavelength of the exposure light, an optical property of the optical system having been adjusted by receiving non-exposure light with a first sensor.

B. Claims 23, 47 and 48

Cohen only discloses the use of the pin mirror interferometer 30 Figs. 5A and 5B which uses light at visible to UV wavelengths generated by source 31 in order to carry out alignment of the mirrors 2-5 relative to the subsystem 8.

Unlike the claimed invention, Cohen does not disclose the receiving of light generated from an x-ray source and having a wavelength which is different from that of the exposure light with a light detector in order to obtain positional information with respect to the x-ray source. Moreover, Cohen does not even suggest the adjustment of the x-ray source with respect to the illumination system based on this positional information.

C. Claims 24 and 49:

Cohen only discloses the alignment of the mirrors 2-5 relative to the subsystem 8.

Unlike the claimed invention, Cohen does not disclose the receiving of light generated concurrently with x-rays from the x-ray source and having a wavelength which is different from that of the exposure light with a light detector in order to obtain positional information with respect to the x-ray source. Moreover, Cohen does not even suggest the adjustment of the x-ray source with respect to the illumination system based on this positional information.

D. Claims 25, 26, 28 and 50:

Cohen only discloses the testing of the alignment of, or the surface shapes of, the mirrors 2-5.

Unlike the claimed invention, Cohen does not even suggest the receiving of exposure light through at least a part of the optical system of which an optical property is adjusted based on first information with respect to the optical system obtained by receiving

non-exposure light, nor the obtaining of second information with respect to the optical system and the adjustment of an optical property of the optical system based on this second information.

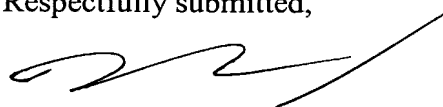
For at least these reasons, it is respectfully submitted that the invention is distinguishable over the applied art. Withdrawal of the rejection under 35 U.S.C. §103(a) respectfully requested.

II. CONCLUSION

For at least these reasons, it is respectfully submitted that this application is in condition for allowance.

Should the Examiner believe that anything further would be desirable in order to place this application in better condition for allowance, the Examiner is invited to contact Applicants' undersigned representative at the telephone number set forth below.

Respectfully submitted,



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MAC:EDM/rda

Attachment:
Appendix

Date: January 17, 2003

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APPENDIX

Changes to Claims:

The following is a marked-up version of the amended claims:

1. (Twice Amended) A method for performing an optical adjustment on an exposure apparatus which exposes an object with exposure light from a light source, comprising:

generating, from said light source, non-exposure light having a wavelength which is different from that of said exposure light, said non-exposure light including at least one of ultraviolet light and visible light;

adjusting an optical property of an optical system through which said exposure light passes by receiving said non-exposure light from said light source through at least a part of the optical system with a first sensor, said optical system including at least an illumination system which irradiates said exposure light onto an original; ~~and~~

generating said exposure light from said light source, said exposure light being incident on said optical system of which the optical property is adjusted; and

receiving said exposure light through at least a part of said optical system with a second sensor to obtain an optical property of said optical system at the wavelength of said exposure light.

23. (Twice Amended) A method of adjusting an exposure apparatus having an x-ray source, which exposes an object with exposure light from the x-ray source, comprising:

generating, from said x-ray source, light having a wavelength which is different from that of said exposure light, said light including one of ultraviolet light and visible light;

receiving said generated light from said x-ray source with a light detector to obtain positional information with respect to said x-ray source; and

adjusting said x-ray source with respect to an illumination system which irradiates said exposure light onto an original based on said positional information, ~~by receiving said light.~~

24. (Twice Amended) A method of exposing an object with exposure light from an x-ray source, comprising:

receiving light generated concurrently with said exposure light from said x-ray source with a light detector to obtain positional information with respect to said x-ray source, the light having a wavelength different from that of said exposure light;

adjusting said x-ray source with respect to an illumination system which irradiates said exposure light onto an original based on said positional information, ~~by receiving light, having a wavelength which is different from that of said exposure light, generated from said x-ray source, said light including one of ultraviolet light and visible light;~~
and

illuminating said original with said exposure light through said illumination system to expose said object with the illuminated original.

25. (Twice Amended) A method of making an exposure apparatus which exposes an object with exposure light, comprising:

arranging an optical system in an optical path through which said exposure light passes, said optical system including ~~an~~ at least an illumination system which irradiates said exposure light onto an original;

providing a light source that generates said exposure light and non-exposure light having a wavelength which is different from that of said exposure light and including at least one of ultraviolet light and visible light;

receiving said non-exposure light from said light source through at least a part of said optical system to obtain first information with respect to said optical system;

adjusting an optical property of said optical system based on said first information; ~~by receiving said non-exposure light from said light source through at least a part of said optical system;~~

receiving said exposure light from said light source through at least a part of said optical system of which the optical property is adjusted to obtain second information with respect to said optical system; and

adjusting ~~an~~ the optical property of said optical system based on said second information. ~~at the wavelength of said exposure light by receiving said exposure light from said light source through at least a part of said optical system.~~

31. (Amended) A method according to claim 30, wherein said optical system includes ~~at least one of an illumination system which irradiates said exposure light on a pattern and a projection system which projects an image of~~ said original illuminated with said exposure light by said illumination system ~~the pattern~~ on said object.

42. (Amended) An apparatus according to claim 41, wherein said first photo-sensor receives said non-exposure light while an optical path therefor is kept in an atmosphere being substantially the same as atmospheric air.

43. (Amended) An apparatus according to claim 12, wherein said first photo-sensor receives said non-exposure light under an atmosphere being different from atmosphere under which said object is exposed.